Well-being through work
L/SH drivers’ work outside the cab: From ergonomics and accident statistics analyses to participatory development and future scenarios

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Background and earlier literature

• Local and short haul (L/SH) truck drivers work in various kinds of work environments as well as that of the truck.
• tasks such as loading and unloading cargo are performed frequently during the work shift.
• Appr. half (or even more) of the work shift is about this work outside the cab
• A majority of the accidents at work (in Finland and in EU level occur in such work environments
• Additionally work-related musculoskeletal disorders are strongly associated to work outside the cab.
• Usually drivers work alone in these work environments, and their safety is not monitored. In cases of accidents, quick help is not always easily available
• The law requires that the employer must be aware of the risks that the employees face not depending where and when the work is made.
• Both observational and archival studies are needed in order to understand the full complexity of a natural environment and also when the possibilities for controlled experiments are limited
HAITEK - “UNDISTURBED” DISTRIBUTION OF GOODS - Manual materials handling and other activities by drivers out-of-the-cab of transportation trucks

Study design

Now:
Video observations

Before:
Accident statistics

Analyses, descriptions, evaluations, evidence

Good practices

Improvements, innovations

Future:
Probable scenarios
Results

Before: national accident statistics

Figure 2. Accidents (n=2880) in the Finnish road transport sector in 2006 classified by the physical specific activity they were related to.

- II Manual materials handling: 57%
- III Securing and unsecuring the load: 20%
- IV Manual installations and refuelling: 5%
- V Maintenance: 5%
- I Ascending into or descending from the truck: 13%
Results

Now: video observations

VIDAR – computer-assisted participative analysis tool for defining possible risks and discomforts

- VIDAR is a Swedish video and computer-assisted analysis method that has been translated into Finnish. (Version 4.1)
- VIDAR is participative method for evaluating physical and psychosocial strain factors of work from video.
- Developed by Arbetslivsintitutet, Chalmers University of Technology and Lund University in 1990s’
- More about VIDAR www.vidarweb.se
- There are several articles and conference papers about VIDAR
  - For example NES2006, Väyrynen & Saaranen, NES 2003 Forsman et al. NES2006 Forsman et al. 2006
Results

Now: video observations

VIDAR: When identifying physically demanding situation

VIDAR: When identifying psychosocially demanding situation

All together over 300 different identifications were made by the drivers and other stakeholders.
Results

Now: video observations

Results from VIDAR analyses: Some examples of identified discomforts
Results

Now: video observations

Results from VIDAR analyses: Some examples of identified discomforts
Results (not to be published on the website, can be found from my PhD thesis on Univ. Oulu web page)

Fig. 3. Physical activities and deviations in identified physically and psychosocially demanding work situations and hazard risks (n=202). Each identification can include one or more physical activities and deviations. Modified from Article II with permission of Taylor & Francis.
Results (not to be published on the website, can be found from my PhD thesis on Univ. Oulu web page)

Fig. 4. Identifications of physically and psychosocially demanding work situations and hazard risks (n=262) divided into work environments where they were performed. Modified from Article IV with permission of Inderscience Publishers.
Results

Scenarios: future

TECHNOLOGIES AND TOOLS
- Vehicles are still the same (many vehicles are rather old, because they are used 15 years on average)
- Manual tools still needed
- Unobstructed loading and unloading work environments
- New assistive ICT technologies inside the cabs and within the cargo (e.g., RFID)
- Usability of new technologies

DRIVERS
- Lack of skilled and healthy drivers
- Work force is ageing
- More women drivers
- Multicultural work communities
- Ability to work
- Realtime follow-up on work ability issues
- New cooperation practices with occupational health care services
- EU directive on drivers’ training
- Service knowhow required

STRAategic, NATIONAL AND INTERNATIONAL TRENDS
- Currently there are a few main national actors in the field in Finland – will there be more international competition?
- Environmental challenges for sustainable transportation
- Specialization, outsourcing and subcontracting or holistic service processes by certain transportation companies
- How will smaller companies survive?

Delivery transportsations in Finland in 2020

COMPANIES
- Customer-orientated service processes
- Macroergonomics and holistic development processes
- Focus on distribution or collection routes or both?
Results

Participative design processes within value chain (utilising the afore mentioned results)

By utilising Focus group findings and VIDAR results

Such as ICT companies (as in this case study) and manufacturers of cargo spaces etc.
Results

Participative design processes within value chain (utilising the afore mentioned results)

Who could solve these problems? - problem owners

- Technology company X: 32%
- Technology company Y: 19%
- Transportation company: 26%
- Driver: 10%
- Client, customer: 13%
Results

Results from the participative design processes
A new ICT application to an existing hand terminal.

KePa contains its’ own section for drivers to assess customers’ environments and activities. The tool also contains a section for customers to assess drivers and transportation company’s work.
Results from the participative design processes
A new ICT application to an existing hand terminal. Contents of the application below

<table>
<thead>
<tr>
<th>Section A</th>
<th>Section B</th>
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<tbody>
<tr>
<td>(For the driver to assess customers)</td>
<td>(For the customer to assess drivers)</td>
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<tr>
<td>1. Approaching the customer premises within vehicle</td>
<td>1. Transportation company’s performance</td>
</tr>
<tr>
<td>- How are the roads maintained and signals placed?</td>
<td>- How are the customer relationships maintained?</td>
</tr>
<tr>
<td>2. Outdoor areas and buildings</td>
<td>2. Delivery and customer satisfaction</td>
</tr>
<tr>
<td>- How are the roads maintained for humans?</td>
<td>- Are the right, non-damaged products are delivered at the right time?</td>
</tr>
<tr>
<td>- Is there enough space for the vehicle and unloading activities?</td>
<td>3. The driver’s performance in customer’s premises</td>
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<tr>
<td>3. Unloading and loading circumstances</td>
<td>- How is the behaviour of the driver?</td>
</tr>
<tr>
<td>- How are the loading and unloading platforms maintained and cleaned?</td>
<td>- How are the drivers working manners?</td>
</tr>
<tr>
<td>- Are there enough signals?</td>
<td>- Is the driver working safely?</td>
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<tr>
<td>4. Fluency of communication procedures</td>
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</tr>
<tr>
<td>- Does the driver get help easily if needed?</td>
<td>- Is the driver willing and able to communicate and give more information if needed?</td>
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<tr>
<td>5. Physical load in unloading and loading activities</td>
<td></td>
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<tr>
<td>- Does the driver need to work in difficult (and repeating) working postures</td>
<td></td>
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<td>- Are motorised devices available if needed?</td>
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<tr>
<td>6. Psychosocial load in unloading and loading activities</td>
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<tr>
<td>- Is there enough information for the driver to perform the work?</td>
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<td>- Are there any exterior risk factors?</td>
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Conclusions

Holistic management processes require broad participation from different stakeholders.
- Employees to work safely, employers to provide safe work equipment, work environment etc., customers to cooperate with transport companies, designers to design safe equipment and so on…
- Video analyses proved to be an efficient tool to provide objective and illustrative information for different stakeholders use

A more profound discussion can be found on the PhD thesis (pdf can be downloaded from University of Oulu’s webpage
Investing in well-being at work is productive

Thank you!

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